Indigenous and Northern Affairs Canada
Affaires autochtones et du Nord Canada

Water Resources Division
Nunavut Regional Office
Iqaluit, NU
X0A 0H0

NWB File # 3BC-EUR1116
CIDMS # 1028360

February 22, 2016

Karén Kharatyan
A/Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven NU, X0B 1J0

Re: 3BC-EUR1116 – Amendment Application – High Arctic Weather Station Eureka – Environment and Climate Change Canada

Dear Mr. Kharatyan,

Thank you for your email of January 20, 2016, soliciting comments on the above mentioned water licence amendment. Please be advised that Indigenous and Northern Affairs Canada (INAC) has completed a review of the amendment application for water licence 3BC-EUR1116 (High Arctic Weather Station, Eureka) submitted by Environment and Climate Change Canada. The review is found in the attached Technical Memo. All documents related to the request posted on the NWB ftp site under 3BC-EUR1116 were included in the review, as well as documents relating to earlier applications for this file.

Comments have been provided pursuant to the Department's mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Indian Affairs and Northern Development Act*.

Should you have any questions or comments, please do not hesitate to contact me at (867) 975-3877 or by email at Amanda.Winegardner@aandc-aadnc.gc.ca.

Sincerely,

Amanda Winegardner
Water Management Specialist

Cc. Karen Costello, Director, Resource Management – INAC, Nunavut Regional Office (NRO)
Scott Burgess, Manager, Water Resources – INAC, NRO
Sarah Forté, Water Management Coordinator – INAC, NRO
Erik Allain, Manager, Field Operations – INAC, NRO
Atuat Shouldice, Resource Management Officer – INAC, Kivalliq Regional Office
Andrew Keim, Water Resources Officer – INAC, NRO

Canada

Technical Review Memorandum

To: Licensing Department, Nunavut Water Board

From: Amanda Winegardner, Water Management Specialist, Water Resources Division, INAC

Date: February 22, 2016

Re: Review of Environment and Climate Change Canada's Amendment Application for Type B Water Licence #3BC-EUR1116

Applicant: Environment and Climate Change Canada
Project: High Arctic Weather Station Eureka
Region: Qikiqtani

A. BACKGROUND

The High Arctic Weather Station (HAWS – Eureka, Nunavut) is located on the Fosheim Peninsula, Ellesmere Island and has been in continuous operation by Environment and Climate Change Canada (ECCC; the applicant) since 1947. Staff and instrumentation at the Eureka station collect weather data for the production of weather forecasts. The station also supports local scientific activities, and exploration projects. Infrastructure at the Eureka station includes living accommodations, power generation, a runway, and water and sewage services; and generally supports a population of ten inhabitants.

ECCC received a renewal of their current Type B licence for the Eureka station in 2011 and are currently seeking an amendment of this licence in advance of the renewal process. The requested amendment is needed in order to complete a runway recapitalization project and to construct a new multi-purpose building. The completion of these projects will involve setting-up a temporary camp for ~50 people as well as quarrying activities.

B. RESULTS OF REVIEW

On behalf of Indigenous and Northern Affairs Canada (INAC)'s Water Resources Division, the following comments and recommendations are provided for the Nunavut Water Board's consideration:

1. Capacity of sewage lagoon

Source: 1) Eureka Quarry Operation Plan, Section 2.7: 'Buildings or Other Facilities'
2) 2013 OM Procedures FINAL, Section 3: 'Management of Wastewater'

Comment: The current sewage lagoon has a capacity for wastes from 21 people; however the applicant's plan for quarrying and construction will involve the installation of a modular camp to house up to 50 workers. The current proposal is to haul gray water and sewage from the modular camp to 'an approved sewage disposal site'. It is unclear whether this approved site is the existing sewage lagoon. Considering the current capacity of the sewage lagoon, there is concern regarding this disposal method for sewage from the modular camp if the lagoon is to be the approved sewage disposal site.

Recommendation 1: INAC recommends that the applicant be requested to clarify the location of the sewage disposal site for sewage and gray water from the modular camp. If the existing sewage lagoon is to be the disposal site for the modular camp material, the applicant should provide an updated plan as to how sewage from the modular camp will be accommodated under the existing capacity of the sewage lagoon, or specify what alternative

arrangements will be made to ensure proper treatment and disposal of sewage from the modular camp.

2. Permafrost stabilization

Source: Eureka Quarry Operation Plan, Section 5.4: 'Permafrost Stabilization & Vegetation'

Comment: The applicant's Quarry Operation Plan (prepared by Nuna East Ltd.) states that "Given the natural ground of the quarry footprint, neither the permafrost layer nor vegetation are relevant factors in this case". However, the plan also notes that "The pit floor will also have a positive grade applied for drainage to flow and will not create a ponding effect''. Given that the Quarry Operation Plan clearly recognizes the importance of avoiding ponding in order to mitigate permafrost melting and the subsequent implications of melting and drainage, it appears counterproductive to state that the permafrost layer is not relevant to the proposed activities. The plan itself has measures in place to prevent ponding and ensure proper drainage from the quarry pit, and care is being paid to mitigate permafrost melt. These proactive measures are important to prevent permafrost melt and thermokarst processes that could alter the overland flow and drainage of water.

Recommendation 2: INAC recommends that the applicant be requested to modify their Quarry Operation Plan to remove this inconsistency.

3. Outstanding questions regarding quarrying activities

Source: 1) Amendment required for quarrying-OCEE.pdf (correspondence)
2) Eureka Quarry Operation Plan

Comment: There were several clarification questions sent by the Nunavut Water Board to the applicant requesting additional information regarding quarrying activities. These included:

- Whether the quarrying activities or the use of subsequent fill material will involve any use of water not already allowed under the licence, or in quantities not allowed under the licence.
- Whether any deposit of waste to water is expected as a result of quarrying activities, either from the use of deleterious substances or due to runoff.
- How waste resulting from the mobile washcar (NB: this is referred to as a 'carwash' in the 'Amendment required for quarrying email' but is stated to be a 'washcar' in the Quarry Operation Plan) at Blacktop Creek will be managed.
- Confirmation that no quarrying activities will occur within 100 metres of any water source.

In answering these questions, the applicant has advised that:

- No water will be used in the quarrying operation.
- Runoff water from the quarrying operation will be collected in collector ditches and that 'clean water will be naturally dispersed following this process'.
- Waste and wastewater from the washcar at Blacktop Creek will be hauled to the sewage lagoon.

Recommendation 3: INAC recommends that the applicant be requested to include in their Quarry Operation Plan how runoff collected in the collector ditches and basin will be assessed to ensure that this runoff meets the criteria for 'clean water', (e.g. meet criteria for *Canadian Environmental Water Quality Guidelines for Protection of Aquatic Life* and that the amended licence include a total suspended sediment (TSS) criterion for runoff water) and is not considered a 'waste' under Nunavut Waters Regulations.

Recommendation 4: INAC recommends that the applicant be required to note in their project summary that wastewater from the Blacktop Creek washcar is also being deposited into the current lagoon, in addition to sewage from the modular construction camp. Clarification is sought as to whether the current lagoon has the capacity to receive wastewater from the Blacktop Creek washcar. INAC also recommends that the applicant be requested to clarify whether there are likely to be hydrocarbon contaminants from the washcar entering the sewage lagoon, as these would not normally be found in the lagoon.

Recommendation 5: INAC recommends that the applicant be requested to confirm that no water will be required for dust suppression in relation to quarrying, crushing and sorting of aggregate, or the runway refinishing.

Recommendation 6: INAC recommends that the applicant be requested to explain the measures that will be taken to prevent dust from quarrying operations from entering nearby streams and water bodies.

4. Ash disposal from temporary camp

Source: 1) Eureka Quarry Operation Plan, Section 2.7: 'Buildings or Other Facilities'
2) 2013 OM Procedures FINAL, Section 4.3.1: 'East Landfill'

Comment: The ash produced from the incinerator at the permanent station is landfilled at the East Landfill as described in the Operations and Maintenance Procedures in order to prevent aerial deposition of ash to surrounding waters. The Quarry Operation Plan states that the temporary construction camp will also have an onsite incinerator, but does not specify how/where the ash from this temporary incinerator will be disposed.

Recommendation 7: INAC recommends that the applicant be requested to clarify whether ash from the temporary camp incinerator will be dealt with in the same manner as described in the Operations and Maintenance Procedures for the permanent incinerator.

5. Plans for construction of new sewage lagoon

Source: 1) 2014 Annual Report, 'Progressive Reclamation Work Undertaken'
2) 2014 Annual Report, 'Analysis of Eureka Sewage Parameters'
3) Lagoon Troubleshooting Background Information-IACE.pdf
4) Troubleshooting Lagoon Systems-IACE.pdf
5) Eureka HAWS Supplemental Investigation- FINAL- IACE
6) Eureka Feasibility Study – FINAL - IACE

Comment: Eureka's current sewage lagoon is within 30 metres of the ocean. The placement of the current lagoon has been an ongoing issue for the station and is well documented in past inspection reports. The applicant reports in their 2014 Annual Report that the design of a new sewage treatment plant and lagoon was to be awarded to a consultant and plans made for proceeding with this project (Request for proposal (RFP) out for tender). It is also clear from the troubleshooting documentation submitted that the applicant is considering various options for design of the new lagoon and for dealing with exceedances from lagoon discharge.

Sampling of the lagoon effluent occurred from 2008-2014 and INAC notes that Biochemical Oxygen Demand exceeded the limit specified in the current licence. The Eureka station has had ongoing difficulty managing exceedances and the previous licence renewal issued for this site indicated that the five year renewal term was deemed as sufficient for ECCC to

address the ongoing problems and concerns regarding wastewater quality and discharge. INAC understands that Environment and Climate Change Canada has been active in seeking solutions relating to these exceedances and their 2014 annual report provides explanations for these exceedances and notes that the construction of the new sewage treatment plant and water lagoon should remediate these exceedance issues.

Recommendation 8: INAC recommends that the applicant be required to submit for review an update and timetable of their own design as to the plan for the new sewage lagoon and schedule for its completion to the Nunavut Water Board, within 90 days of the issuance of the amended licence.

6. Agreements with Department of National Defense regarding reclamation

Source: 3BC-EUR1116 Licence, Section III, Part J: 'Monitoring program'

Comment: ECCC's current licence for Eureka requires that the Licensee "communicate to the Nunavut Water Board and INAC any agreements in place with the Department of National Defense (DND) or other parties, for reclamation initiatives along with their respective implementation schedules". Agreements of this nature are not available in the Public Registry of the Nunavut Water Board ftp site.

Recommendation 9: INAC suggests that the applicant be asked to communicate these agreements to the Nunavut Water Board and INAC.

7. Term of licence

Source: 3BC-EUR1116 Licence

Comment: INAC notes that the current licence will expire on June 7th, 2016; and that this impending expiry will occur prior to the completion of the work proposed in the amendment application.

Recommendation 10: INAC recommends that the applicant work to submit a renewal application to the Nunavut Water Board in a timely fashion.